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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/500,079

03/01/2005

Jochen Kraft

14603-007US1

5865

26161 7590 09/12/2008
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EXAMINER

MAI, ANH D

ART UNIT

PAPER NUMBER

2814

NOTIFICATION DATE

DELIVERY MODE

09/12/2008

ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

PATDOCTC@fr.com

Office Action Summary	Application No. 10/500,079	Applicant(s) KRAFT ET AL.	
	Examiner Anh D. Mai	Art Unit 2814	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 06 June 2008.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,2,4,7,11-18 and 28 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,2,4,7,11-18 and 28 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

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DETAILED ACTION

Status of the Claims

1. Amendment filed June 6, 2008 is acknowledged. Claims 1, 13, 19 and 20 have been amended. Claims 3, 5, 8, 10 and 19-27 have been cancelled. Claims 1, 2, 4, 7, 11-18 and 28 are pending.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claims 1, 2, 4, 7, 11-18 and 28 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 1 and 13 recite: a base layer comprising:...

first doping layer that is doped with a *trivalent substance*; ...

second doping layer that is doped with a *trivalent substance*;...

... the first and second doping layer are **counter-doped with a pentavalent substance** from.....

There are three scenarios might happen upon the counter-doped:

A. If the dopant concentration of pentavalent substance were less than that of the trivalent substance, then, the conductivity type of the first and second layers remain P-type.

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- B. If the dopant concentration of pentavalent substance were higher than that of the trivalent substance, then, the conductivity type of the first and second layers become N-type.
- C. If the dopant concentration of pentavalent substance were the same as that of the trivalent substance, then, the first and second layers are non-conductive (neutralized).

Claims 1 and 13 appear to encompass both first and second layers being counter-doped.

As shown above, the conductivity of the first and second layers could not be determined.

Therefore, the scope of the claims 1, 2, 4, 7, and 11-18 can not be fairly determined.

Claim 28 recites:

Lines 7-10: a first doping layer that is doped with a *trivalent substance*, that extends into the extrinsic region and that is *counter-doped* with a *pentavalent substance* from the emitter region; wherein the first doping layer comprises a concentration of the trivalent substance that is between $E18$ and $5E20\text{ cm}^{-3}$;...

Lines 11-16: a second doping layer that is doped with the *trivalent substance*, that extends into the extrinsic region, and that is *counter-doped*, at least part-way through, with a *pentavalent substance* from the emitter region, wherein the second doping layer comprises a concentration of the pentavalent substance that is between $E20$ and $E21\text{ cm}^{-3}$, wherein the second doping layer comprises a concentration of the trivalent substance that is between $E18$ and $E19\text{ cm}^{-3}$; ...

As discussed above in claims 1 and 13, the concentration of pentavalent substance ($E20$ and $E21\text{ cm}^{-3}$) is higher than that of the trivalent substance of the first ($E18$ and $5E20\text{ cm}^{-3}$) and second ($E18$ and $E19\text{ cm}^{-3}$) doping layers, respectively. Therefore, the conductivity type of the first and second layers become N-type, since both are being counter-doped by an higher concentration of pentavalent substance.

Claim 28 is indefinite because, the limitations appear to encompass the first and second doping layers being both N-type and P-type at the same time.

3. Claims 11, 12 and 14-16 are further rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 11 and 14 recite: wherein the second doping layer and the third doping layer are **doped with germanium**.

It is well known in the art that “germanium” is a group IV element. Thus, germanium is neither trivalent nor pentavalent. Therefore, claims 11, 12 and 14-16 are also indefinite.

Note that, although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

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Since the scope of the pending claims can not be determined. The merits of the claims can not be fairly examined.

Response to Arguments

4. Applicant's arguments filed June 6, 2008 have been fully considered but they are not persuasive.

Applicant argues: "neither claim 1 nor claim 13 recites the conductivity of first and second layers".

Actually, the conductivity of first and second layers are recited in claims 1 and 13 as, doped with *trivalent substance*, hence p-type. Since these layers being counter doped with pentavalent, n-type. Thus, the actual dopant type of the first and second layers could not be determined. Therefore, the claims are indefinite.

The same also applies to claim 28 as well.

Moreover, Applicant admitted that at lines 20 and 21, the specification read:

Here, the counter-doping is designed such that the doping of the first doping layer 7 is at least compensated, and may be actually over-compensated.

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If “compensated” the conductivity is remained the same type but at a lower concentration, from p to p⁻.

If “over-compensated” the conductivity would become opposite conductivity, from p-type to n-type.

Thus, the true conductivity type of the first and second layer have not been clearly defined, both of which are depended on the counter-dope level.

Since the metes and bounds of the claims have not been clearly defined, claims 1, 13 and 28 and their dependents are indefinite.

With respect to claim 11 and 14, aside from “the first and second layers of trivalent doped and being counter doped with pentavalent”, both of these claims clearly recites:

“transistor of claim 1 or 13, wherein the second **doping layer** and the third **doping layer** are doped with germanium”.

Note that, the limitation is not “further comprising” but “wherein”.

“wherein” signifies the existing doping layer, not “in addition to”.

Therefore, all rejections are maintained.

Conclusion

5. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

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A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Anh D. Mai whose telephone number is (571) 272-1710. The examiner can normally be reached on 8:00AM-5:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wael Fahmy can be reached on (571) 272-1705. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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/Anh D. Mai/

Primary Examiner, Art Unit 2814